Using an Electronic Medical Record to Perform Clinical Research on Mitral Valve Prolapse and Panic/Anxiety Disorder

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We have developed an electronic medical record that is extensively used by clinicians at a hospital-based academic internal medicine practice. We were interested in whether routinely collected textual data in such an electronic medical record could be used to help perform observational clinical trials by using the computer to perform searches through the electronic database. In addition, we were interested in whether a simple search algorithm, as might be developed by a clinician without assistance from an informatician, could provide useful information for the performance of an observational clinical study. To examine this question, we chose the possible relationship between mitral valve prolapse and panic/anxiety disorder as evidenced in patients seen in an internal medicine practice.

Patients were classified by the computer as having mitral valve prolapse if the text strings "MVP" or "valve prolapse" occurred on the Problem List, either in the name of the problem or in the field for free text, or if the text string "systolic click" appeared in the Initial Note.

Patients were classified by the computer as having panic/anxiety disorder if the text strings "panic" or "anxiety" occurred on the Problem List, either in the name of the problem or in the field for free text.

There were 5767 patients who met the criteria for entry into the study. The computer classified 160 patients as having mitral valve prolapse, for an absolute risk of 0.028. The computer classified 268 patients as having panic/anxiety disorder, for an absolute risk of 0.046. There were 11 patients with both disorders. The relative risk of panic/anxiety disorder, in the presence of mitral valve prolapse, was 1.50 (95% C.I., 0.84 to 2.69).

We used logistic regression models that controlled for age and sex to further examine the relationship between mitral valve prolapse and panic/anxiety disorder.

In a model where panic/anxiety disorder was the dependent variable, the odds ratio associated with mitral valve prolapse was 1.57 ($p=0.16$). Panic/anxiety disorder increased slightly with increasing age, with an odds ratio of 1.008 ($p=0.03$) for each year of age. It was less common in men, with an odds ratio of 0.85 ($p=0.23$), than in women.

In a model where mitral valve prolapse was the dependent variable, the odds ratio associated with panic/anxiety disorder was 1.60 ($p=0.14$). Mitral valve prolapse decreased with increasing age, with an odds ratio of 0.98 ($p<0.001$) for each year of age. It was less common in men, with an odds ratio of 0.56 ($p=.001$), than in women.

We are performing a chart review to determine the sensitivity and specificity of the computer-based review. An accurate or sensitive computer-based search could greatly reduce the number of charts that need to be reviewed in performing observational clinical trials. If such simple text-searching algorithms perform well, a general tool for clinicians, built within a clinical information system, may assist in the performance of clinical research on electronic medical records.

0195-4210/95/$5.00